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NOTES ON *ONYCHYLIS* LECONTE WITH DESCRIPTIONS OF TWO NEW SPECIES (CURCULIONIDAE)

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The following notes and descriptions of new species are presented as a contribution to the knowledge of the little known curculionid genus, *Onychylis* LeConte. The genus, distributed in North and Central America, now contains ten species, two of which are described herein as new. Specimens of all species assigned to *Onychylis*, except *meridionalis* Champion described from Guatemala and *cretatus* Champion from Mexico, have been seen. Type material of the remaining species, except *nigrirostris* (Boheman), has been examined. A more complete study of this group of weevils must await the accumulation of additional material, especially from Mexico and Central America.

Onychylis LeConte may be characterized as follows. Similar in general habitus to *Lissorhoptrus* LeConte. Rostrum moderately and evenly curved, slightly shorter to distinctly longer than pronotum. Scrobes short, descending to underside of rostrum. Suprascrobal groove on each side of rostrum extends from above antennal insertion posteriorly to front margin of eye. Antenna inserted just before middle of rostrum; funicle 6-segmented; club elongate-oval, pubescent. Prothorax slightly to distinctly wider than long, feebly to rather strongly constricted before apex. Ocular lobes prominent. Alternate intervals of elytra each with a row of recurved setae which may be either prominent or small and inconspicuous. First abdominal suture broadly arcuate in middle. Inner margin of each tibia with a furrow densely clothed with elongate, plumose scales; each tibia with apical spine. Third tarsal segment deeply emarginate, wider than second; fourth tarsal segment elongate, projecting well past lobes of third. Tarsal claws simple, divergent.

Measurements of the length of the rostrum were made as indicated in figure 1,C. Body length was measured along a dorsal line from the front margins of the eyes to the apices of the elytra. Other structures are meas-

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ured at the greatest width or length. The male may be recognized most easily by the rather distinct impression in the middle of the first abdominal sternum; this segment is more or less convex in the female. The antennae of the male are inserted nearer the apex of the rostrum than in the female; however, this difference is often so slight that both sexes must be available for comparison before the character can be used for their separation.

Although not including all species of *Onychylis* (*meridionalis* Champion and *cretatus* Champion are omitted), the following key will aid in the identification of those occurring in America north of Mexico, and will point out the essential characteristics of the two new species described here.

1. Tibiae each with a row of denticles along inner margin; suprascrobal grooves bare, not filled with scales; rostrum slender (fig. 4) ----- 2
 Tibiae without denticles along inner margins; suprascrobal grooves filled with plumose scales; rostrum stouter (figs. 1, 2, 3)----- 3
- 2(1). Sides of prothorax parallel, or almost so, in basal half; rostrum of female distinctly longer than pronotum (3.8:2.7); length of body, 3.3-4.4 mm.; Texas----**TEXANUS** Burke
 Sides of prothorax more rounded; rostrum of female only slightly longer than pronotum (2.8:2.5); length of body, 2.7-3.3 mm.; Mexico and Guatemala-----**SETIGER** Champion
- 3(1). Body elongate-oval; prothorax slightly wider than long, sides usually parallel in basal two-thirds (sometimes feebly rounded); (fig. 6)----- 4
 Body more robust; prothorax distinctly wider than long, sides usually strongly rounded, never parallel in basal two-thirds (figs. 5, 7)----- 5
- 4(3). Rostrum rather slender (fig. 1), distinctly longer than pronotum in female, slightly so in male; dark patterns of scales on pronotum and elytra; Texas to Virginia-----
 ----- **LONGULUS** LeConte
 Rostrum stouter (fig. 2), about same length as pronotum in either sex; scales rather uniformly gray throughout, no dark patterns above; El Salvador and Guatemala----
 -----**SECUNDUS** n. sp.
- 5(3). Alternate intervals strongly elevated; setae on these intervals recurved and conspicuous; prothorax very coarsely punctured, strongly constricted before apex (fig. 5); Texas
 ----- **ALTERNANS** LeConte
 Alternate intervals scarcely, if at all, elevated; setae on these intervals minute; prothorax less strongly constricted before apex, never coarsely punctured----- 6
- 6(5). Fourth segment of hind tarsus distinctly longer than third (fig. 8); legs slender; scales dark gray, not entirely obscuring deep black color of derm; California-----**ESSIGI** Tanner
 Fourth segment of hind tarsus stouter, little if any longer than third (fig. 9); legs stouter; dense, agglutinated scales completely obscuring derm----- 7
- 7(6). Tarsal claws slender, not strongly curved (fig. 13); apical spine of hind tibia stout (fig. 11); smaller and more robust; length of body, 2.2-2.4 mm.; Texas----**PARVULUS** n. sp.
 Tarsal claws stouter, usually more strongly curved (fig. 12); apical spine of hind tibia slender (fig. 10); larger; length of body, 2.8-3.2 mm.; Eastern U. S., Ontario, Canada
 ----- **NIGRIROSTRIS** (Boheman)

Onychylis texanus Burke

Onychylis texanus Burke, 1959, Coleopt. Bull. 13: 36.

As indicated in the preceding key, this weevil and *O. setiger* Champion are readily distinguishable from all other species of *Onychylis*. On the basis of these differences the two species may eventually have to be removed from the genus. However, at the present it appears expedient to treat them under *Onychylis*.

One specimen before me from Tehuantepec, Oaxaca, Mexico agrees well with *texanus*, except that it has the sides of the prothorax much more strongly rounded. Additional material is needed to determine whether

or not it is conspecific with *texanus*, a species now known only from Anderson and Walker counties, Texas.

Onychylis setiger Champion

Onychylis setiger Champion, 1902, Biol. Centrali-Americana, Col. 4: 134.

Described from "Mexico, Amula in Guerrero." Three specimens are at hand from Chaparion, Jutiapa, Guatemala (D. Lauck).

Onychylis longulus LeConte

Onychylis longulus LeConte, 1876, Proc. American Philo. Soc. 15: 179.

Described from Michigan. Specimens have been examined from Kansas, Louisiana, Virginia and Texas. I have collected specimens of this weevil in fairly large numbers on *Pontederia cordata* L. near College Station, Texas, from March through September.

Onychylis alternans LeConte

Onychylis alternans LeConte, 1876, Proc. American Philo. Soc. 15: 179.

Very easily separated from all other species of *Onychylis* by characters presented in the key. Known only from Texas.

Onychylis essigi Tanner

Onychylis essigi Tanner, 1954, Great Basin Nat. 14: 77.

A paratype specimen from the type locality, Saratoga Springs, Death Valley, California, was examined. To my knowledge this species has not been reported to occur elsewhere.

Onychylis nigrirostris (Boheman)

Notiodes nigrirostris Boheman, 1843, Schön. Curc. 7, Pt. 2, 184.

Onychylis nigrirostris (Boheman), LeConte, 1876, Proc. American Philo. Soc. 15: 178.

This is the most common species of *Onychylis*. Specimens have been seen from Florida, Virginia, Pennsylvania, Massachusetts, North Carolina, Illinois, Wisconsin, and Ontario, Canada.

Blatchley (1916, Rhynch. N.E. America, p. 226) records *nigrirostris* as occurring abundantly on *Pontederia cordata* L. in Florida, and on *Sagittaria* near New York City. Specimens bearing the host label, "*Decodon verticillatus*," from Ottawa, Ontario have been examined.

Considerable variation exists among the specimens treated here as *nigrirostris*. Although none of these variations in the small number of specimens available for study from each locality appears to warrant additional segregates, a more extensive investigation might reveal that a complex is actually involved.

Onychylis secundus NEW SPECIES

(FIGURE 2)

Closely related to *Onychylis longulus* LeConte from which it may be separated by the characters set forth in the key.

Elongate-oval; derm reddish-black; scape and funicle of antenna testaceous, club darker, tarsi and apex of rostrum reddish-brown; body and legs covered with a dense coating of rather uniformly gray, agglutinated scales.

Holotype male: Length, 2.7 mm.; width (across elytra), 1.3 mm.; width of pronotum, 0.77 mm.; length of pronotum, 0.70 mm.; length of rostrum 0.70 mm.

Rostrum stout, distinctly curved, as long as pronotum; basal two-thirds with dense coating of scales; apical third clothed with plumose scales and suberect, flattened setae on area immediately below origin of antenna, extreme apex glabrous, shining. Suprascrobal groove densely clothed with plumose scales, opening posteriorly against upper two-thirds of front margin of eye. *Antenna* inserted immediately before middle of rostrum; scape rather slender, abruptly clavate in apical third, apex not reaching eye; funicular segment 1 conical, segment 2 as long as 3 + 4, segments 3-6 very nearly equal in length, each as wide as long; club elongate-oval, densely pubescent and with scattered, erect setae, club as long as preceding five funicular segments combined. *Eyes* oval. *Head* with a few decumbent setae on frons adjacent to upper anterior margin of eye. *Prothorax* slightly wider than long, sides parallel in basal two-thirds converging to a feeble subapical constriction; coarse punctures obscured thence by thick covering of scales; pronotal disc bearing a few scattered, decumbent setae. *Elytra* 2.7 times longer than prothorax, 1.6 times wider; base emarginate; humeri oblique, rounded behind; sides of elytra parallel to about three-fifths distance from base then converging to rounded apex; alternate intervals more strongly elevated, each bearing a row of slender, recurved setae; some of the setae on intervals 3, 5 and 7 borne on summits of slight elevations along intervals; striae, beneath scales, deeply impressed; striae punctures deep. Ventral side of body with irregular-shaped to rounded, plumose scales on and around coxae and on last three abdominal sterna, elsewhere clothed with agglutinated scales like those above. First abdominal sternum with a distinct median impression which extends between the hind coxae onto posterior margin of metasternum. *Femora* gradually clavate, covered with a dense coating of scales and scattered, decumbent setae. *Tibiae* stout, middle ones slightly more curved near apex than others, each tibia with a slender apical spine. *Tarsi* slender; third segment deeply emarginate, only very slightly wider than 2, segment 4 equal in length to 3. Claws long, moderately curved, divergent.

Female allotype: Length, 3.1 mm.; width (across elytra), 1.5 mm.; width of pronotum, 0.88 mm.; length of pronotum, 0.74 mm.; length of rostrum, 0.77 mm.

Resembles male holotype except in size and the usual sexual characteristics.

Type material: Male holotype, San Antonio, La Union, EL SALVADOR, Jul. 28-1957, (D. Lauck); female allotype, Candeloria, St. Ana, EL SALVADOR, Jul. 28-1957, (D. Lauck); and one male paratype, same data as holotype, all to be deposited in Collection of Illinois Natural History Survey. One additional male paratype, Jutiapa, Jutiapa, GUATEMALA, Jul. 30-1957, (D. Lauck); to be deposited in Collection of Entomology Department, A. & M. College of Texas.

Onychylis parvulus NEW SPECIES

(FIGURES 3, 7, 11, 13)

Similar to *Onychylis nigrirostris* (Boheman), but may be separated from that species by the characters presented in the key.

Oval, robust; derm dull black; antennae, tarsi and apex of rostrum dark reddish-brown; body and legs covered by a dense coating of light gray to brownish scales.

Holotype male: Length, 2.2 mm.; width (across elytra), 1.1 mm.; width of pronotum, 0.81 mm.; length of pronotum, 0.63 mm.; length of rostrum, 0.63 mm.

Rostrum stout, moderately curved, as long as pronotum, expanded past antennal insertions, basal two-thirds covered with a dense coating of scales, apical third bare except for a few minute, recumbent setae borne in punctures immediately below origin of antennae; suprascrobal groove on each side of rostrum thickly clothed with plumose scales, upper margin sinuate, extending from above antennal insertions posteriorly to open against middle third of front margin of eye. *Antenna* rather stout; scape not reaching eye, abruptly enlarged in apical third; funicle three-fourths as long as scape, segment 1 conical, almost as wide as long, 2 as long as 3+4, segments 3-5 equal in length, 6 wider and slightly longer; club elongate-oval, as long as preceding five funicular segments combined, basal segment more thinly clothed than others. *Eyes* oval. *Prothorax* distinctly wider than long, sides moderately rounded, feebly constricted before apex; pronotum densely but finely punctate, derm between punctures finely granulate; a dark, broad, median vitta present on disc of pronotum flanked on each side by a gray, sublateral vitta. *Elytra* oval, 2.3 times longer and about 1.4 times wider than prothorax; base emarginate; humeri rounded; sides of elytra parallel in basal half thence rounded into slight emargination before apex; intervals feebly convex, alternate ones bearing a few inconspicuous setae; striae punctures beneath dense scales, deep; no definite color pattern, gray and brown scales intermixed. Underside with rounded to irregular-shaped, plumose scales on and around coxae and on last three abdominal sterna. First abdominal sternum with distinct median impression which extends between widely separated hind coxae onto posterior margin of metasternum. *Femora* strongly clavate, bearing scattered, recurved setae. *Tibiae* stout, each with a rather short apical spine. *Tarsi* setose; segment 3 emarginate, dilated, slightly wider than 2; segment 4 a little longer than 3. Claws slender, not strongly curved, divergent.

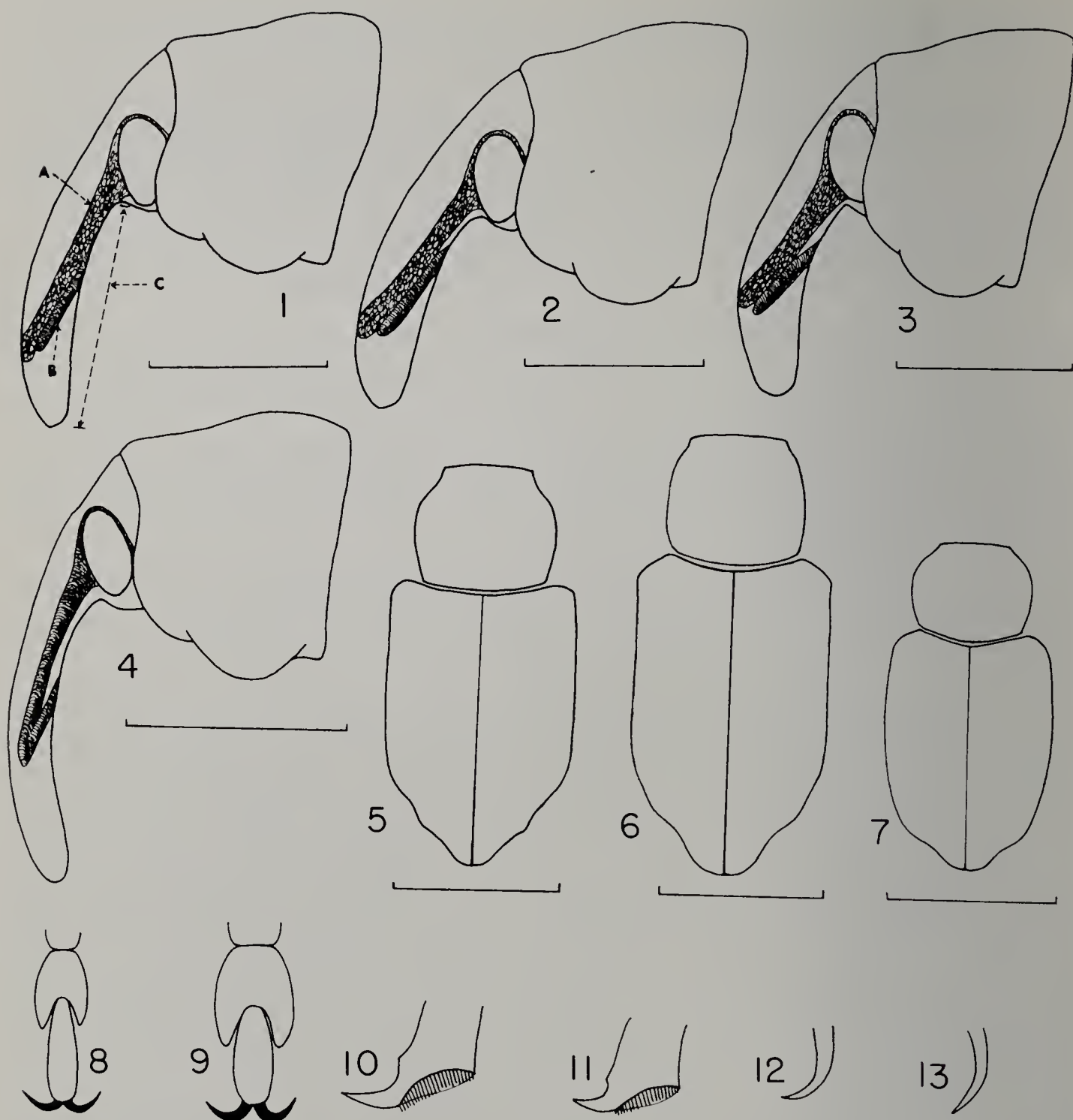


FIGURE 1.—Side view of rostrum, head and prothorax of *Onychylis longulus* LeConte, male, A = suprascrobal groove; B = scrobe; C = line along which length of rostrum is measured. FIG. 2.—Side view of rostrum, head and prothorax of *O. secundus* n. sp., holotype male. FIG. 3.—Same of *O. parvulus* n. sp., holotype male. FIG. 4.—Same of *O. texanus* Burke, male. FIG. 5.—Dorsal outline of prothorax and elytra of *O. alternans* LeConte. FIG. 6.—Same of *O. longulus* LeConte. FIG. 7.—Same of *O. parvulus* n. sp. FIG. 8.—Dorsal view of third and fourth hind tarsal segments of *O. essigi* Tanner. FIG. 9.—Same of *O. nigrirostris* (Boheman). FIG. 10.—Apex of hind tibia of *O. nigrirostris* (Boheman). FIG. 11.—Same of *O. parvulus* n. sp. FIG. 12.—Side view of hind tarsal claw of *O. nigrirostris* (Boheman). FIG. 13.—Same of *O. parvulus* n. sp. (FIGS. 1-3, line = 0.5 mm. FIGS. 4-7, line = 1 mm. FIGS. 8-13, greatly enlarged.)

Allotype female: Length, 2.4 mm.; width (across elytra), 1.3 mm.; width of pronotum, 0.88 mm.; length of pronotum, 0.70 mm.; length of rostrum, 0.66 mm.

A deep median groove is present in the apical portion of the fifth ab-

dominal sternum. Other than this and the usual sexual differences it agrees with the male holotype.

Type material: Male holotype, female allotype and four paratypes, Lange's Mill, Gillespie Co., Texas, V-3-1959 (S.D. & H.R. Burke), to be deposited in Collection of Entomology Department, A. & M. College of Texas. The type series was collected while sweeping vegetation along the banks of a small stream. The paratypes agree well with the holotype and allotype; they range from 2.2 to 2.4 mm. in length.

A ONE-STEP CLEARING AND MOUNTING TECHNIQUE FOR MALE GENITALIA IN COLEOPTERA

In most groups of Coleoptera an examination of the male genitalia has become mandatory for acquiring a clear understanding of the proper taxonomic position of the various species. Mechanical barriers to copulation between externally similar populations of beetles are sometimes revealed by this approach. In certain large, complex genera the structure of the genitalia often leads to the most satisfactory arrangement of species groups.

Methods of preparation of male genitalia for study range from the rather crude to the rather complex, and no one method is necessarily the best for all groups. For larger specimens which have been relaxed (or killed with ethyl acetate vapor, as recommended by Valentine, 1942,¹ and Lindroth, 1957²), it is often possible to grasp and evert the aedeagus with iris forceps, and thus mount and dry the specimen with its genitalia extruded. In an alternative procedure the aedeagus can be dissected out, either through the dorsum as recommended by Lindroth (1954, pp. 119-120³), or through the posterior end of the abdomen, and mounted with glue on a cardboard or plastic point on the same pin as the specimen. If internal structures are not important, such simple methods usually suffice.

In certain groups, however, the structures within the tegmen of the median lobe require examination. This is especially true in the carabid tribe Trechini,

the group of Coleoptera with which the writer is most familiar. The genus *Pseudanophthalmus* Jeannel, a very large, externally homogeneous group of eyeless cave trechines, can be satisfactorily distributed into species groups only on the basis of the structure of the transfer apparatus. The aedeagi of such groups must consequently be cleared and mounted in some way for microscopic study.

The usual clearing technique involves gentle boiling in 10-15% potassium hydroxide solution, followed by treatment in clove oil or some other clearing agent (Lindroth, 1954, 1957). The cleared genitalia are subsequently mounted on slides in Canada balsam or sandwiched between thin sheets of plastic (Valentine, 1942) and attached to the specimen pin. Some workers who prefer temporary mounts customarily run the specimen pin through the cork of a small vial in which the cleared aedeagus is stored in glycerin.

Not only is such individual treatment tedious and time-consuming, but there is danger that extremely small aedeagi may be accidentally lost during the procedure. For type and other valuable specimens the aedeagi of which are stored in a glycerin vial, there is always the danger of loss or damage to the genitalia whenever they are examined on temporary mounts. Accompanying the KOH method, especially when used in combination with temporary slide preparation, there is the normal tendency

on the part of the investigator to prepare as few aedeagi as possible. Although the aedeagus is the least variable of species characters in the Trechini, experience has indicated that it is hazardous to base diagnoses between taxa (especially subspecies or closely related species) on relatively minor differences between one aedeagus each prepared from two supposedly different samples. When the sample size is large enough, the writer tries to examine from 3 to 6 aedeagi of each sample to be compared, though even 6 preparations may be far too few if statistical treatment of aedeagal characters is indicated. In the Trechini a rapid and effective method of clearing and mounting male genitalia is an absolute necessity.

The method described below, which has been employed in the study of aedeagi of various Trechini and Agonini (Carabidae), is a comparatively simple, direct, one-step process in which the genitalia are placed in a water-soluble mounting medium which contains its own clearing agent. The specimen is relaxed in boiling water and transferred to a small dish of Barber's fluid. The aedeagus is removed and cleaned of excess muscle and connective tissue, then is pipetted onto a slide and covered with two or three drops of Down's medium. It is then oriented within the drop of medium by means of insect pins and a cover slip is applied. Enough medium is added so that a small amount runs out at the edges of the cover slip on all sides. Both slide and specimen are labeled with an accession number. After 48 hours at room temperature the genitalia are usually sufficiently cleared to permit detailed examination of the copulatory pieces at high magnification.

Down's medium (Downs, 1943⁴) is one of several formulas employing polyvinyl alcohol, lactic acid, phenol, and water. The original formula calls for Grade RH 349 polyvinyl alcohol, obtainable in powder form at low cost from

E. I. DuPont de Nemours Company, under the trade name "Elvanol". To make up this medium a stock solution of 15 gm of "Elvanol" is dissolved in 100 gm of distilled water at 80°C. The working formula is prepared from 56 parts of the stock, 22 parts of lactic acid, and 22 parts of phenol. Aedeagi mounted in this medium in April, 1957, are in a perfect state of preservation, nearly three years later, and there is no indication of decomposition or crystallization of the medium. Remounting is facilitated by the fact that the medium is water soluble, though it is usually necessary to immerse the slide of the specimen to be remounted in a dish of water for several hours.

Downs (1943) reports this medium satisfactory for clearing and mounting mosquito larvae, and the present writer has used it for small coleopterous larvae with excellent results.

Communications from other workers would be appreciated regarding the advantages, disadvantages, and further applications of this technique in the study of male beetle genitalia.—THOMAS C. BARR, JR., *Department of Biology, Tennessee Polytechnic Institute, Cookeville.*

¹ VALENTINE, J. MANSON. 1942 On the preparation and preservation of insects, with particular reference to Coleoptera. *Smithsonian Misc. Coll.*, vol. 103 (6): 1-16.

² LINDROTH, CARL H. 1957. The best method for killing and preserving beetles. *Coleopterists' Bulletin* 11: 95-96.

³ LINDROTH, CARL H. 1954. Random notes on North American Carabidae (Coleoptera). *Bull. Mus. Comp. Zool., Harvard*, 111 (3): 117-161.

⁴ DOWNS, WILBUR G. 1943. Polyvinyl alcohol: a medium for mounting and clearing biological specimens. *Science* 97: 539-540.
